EH-150 Series PLC
Engineering Guideline

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CPU Modules

Model	Name		EH-150 Type I	EH-150 Type II	EH-150 Type III		EH-150 Type IV
	Type		EH-CPU104	EH-CPU208	EH-CPU308	EH-CPU316	EH-CPU448
Number of I/O	64 points I/O modules		512 points	1024 points maximum			
Control specifications	CPU		32-bit RISC processor				
	Processing system		Stored program cyclic system				
	Processing speed	Basic commands	1.0 µs / command				0.1 µs / command
		Application commands	several 10 µs / command				
	User program memory (1step = 4Byte)		16kByte (RAM) 16kByte (FLASH)	32kByte (RAM) 32kByte (FLASH)		64kByte (RAM) 64kByte (FLASH)	192kByte (RAM) 192kByte (FLASH)
Operation processing specifications	Basic commands		39 types, such as LD, LDI, AND, ANI, OR, ORI, ANB, ORB, OUT, MPS, MRD, MPP				
	Arithmetic and application commands		85 types, such as arithmetic (ADD, SUB, MUL, DIV,etc.), jump, subroutine,		95 types, such as arithmetic, jump, subroutine, extraction, high speed scan,		113 types, such as arithmetic, jump,
I/O processing specifications	External I/O	I/O processing system	Refresh processing				
	Internal output	Bit	1984 points				
		Word	4.096 words	8.192 words	17.408 words	22.528 words	50.176 words
		Special Bit	64 points				
		Special Word	512 words				
		CPU link	16,384 points (1024words) x 2 loops				
		Bit/word shared	16,384 points (1024words)				
	Timer/Counter	Points	512 points (TD + CU), however TD is up to 256 points *1				
		Timer set value	0 to 65,535, time base 0.01s, 0.1s and 1s (0.01s has maximum 64 points *2)				
		Counter set value	1 to 65,535 times				
	Edge detection		512 points (DIF0 to DIF511: decimal) + 512 points (DFN0 to DFN511: decimal)				
Peripheral devices	Program system		IL, LD, FBD, SFC, ST				
	Peripheral device		Programming software Pro-H (Win95/98/NT), Command language programmer, Portabel graphic				
Maintenance functions	Self-diagnosis		PLC abnormal (LED display), microcomputer abnormal, watchdog timer abnormal, memory abnormal, program abnormal, system ROM/RAM abnormal, scan time monitoring, battery voltage low detection,				
Additional functions	Memory board		-		For program transmission, for Data logger		
	Special instructions		-		PID instruction, Data logging instruction		
	RS-485		-		Selectable RS485 mode for Port 1 (Only General purpose mode)		Selectable RS485 mode for Port 1
	Fieldbus module control function		-		●		●
	Ethernet communication module control		-		-		●

Memory Boards

Item	EH-MEMP	EH-MEMD
Program capacity	64kByte	64kByte
Data capacity	-	384kWords
Program transmission function	Available	Available
Memory type	FLASH	FLASH

Base Racks

Item	EH-BS3	EH-BS5	EH-BS8
Max. number of I/O modules *1	3	5	8
Restriction	Communication modules only usable on slot 0,1 or 2		
Measurements in mm (H x W)	100 x 222.5	100 x 282.5	100 x 372.5
Internal current consumption (5V)	Approx. 200mA		

*1: Beside this, there is always a slot for a power supply module and a CPU or I/O controller.

Power Supply Modules

Item		EH-PSA	EH-PSD
Input	Rated voltage range	85 to 264V AC	24V DC (+/-10%)
	Current	1A or less (85 to 264V AC)	1.25A or less (24V DC)
	Rush current	50A or less (Ta=25°C)	100A or less (Ta=25°C)
Output current	5V DC	3.8A	3.8A
	24V DC	0.4A	-

Digital Input Modules

Item		EH-XD8	EH-XD16	EH-XD32	EH-XD64	EH-XA16	EH-XAH16
Input specification		DC-input				AC-input	
I/O assignment		X16	X16	X32	X64	X16	X16
Input voltage		24V DC				100 to 120V AC	200 to 240V AC
Allowable input voltage range		19.2 to 30V DC			20.4 to 28.8V DC	85 to 132 V AC	170 to 264V AC
Input impedance (Approximately)		3.5kΩ	5.9kΩ	5.6kΩ	5.6kΩ	16kΩ(50Hz), 13kΩ(60Hz)	32kΩ(50Hz), 27kΩ(60Hz)
Input current (Approximately)		6.9mA	4.0mA	4.3mA	4.3mA	4.8 to 7.6mA (100V AC/50Hz)	4.3 to 8.0mA (200V AC/50Hz)
Operating voltage	ON voltage	15V or more				79V or more	164V or more
	OFF voltage	5V or less				20V or less	40V or less
Input lag	OFF -> ON	5ms or less (4ms typ.)			1ms or less	15ms or less	
	ON -> OFF	5ms or less (4ms typ.)			1ms or less	25ms or less	
Number of input points		8	16	32	64	16	16
Number of common points		1	1	1	2	1	1
Polarity		None				None	
Insulation system		Photocoupler				Photocoupler	
Input display		LED's (green)				LED's (green)	
External connection		Removable type screw terminal block		Connector	Connector (2x)	Removable type screw terminal block	
Internal current consumption (5V)		Approx. 26mA	Approx. 51mA	Approx. 100mA	Approx. 70mA	Approx. 51mA	Approx. 51mA

Transistor Output Modules, Sink Type

Item		EH-YT8	EH-YT16	EH-YT32	EH-YT64
Output specification		Transistor output (sink type)			
I/O assignment		Y16	Y16	Y32	Y64
Rated load voltage		12/24V DC (+10%, -15%)			
Minimum switching current		1mA			
Leak current		0.1mA			
Maximum load current	Output	0.3A	0.3A	0.2A	0.1A
	Common	2.4A	4.0A	6.4A	2.0A
Output response time	OFF -> ON	0.3ms or less			
	ON -> OFF	1.0ms or less			
Number of output points		8	16	32	64
Number of common points		1	1	1	2
Surge removal ladder		Diode			
Fuse (per common) *1		4A	8A	8A	3A
Electronic short circuit protection		-			●
Insulation system		Photocoupler			
Output display		LED's (green)			
External connection		Removable type screw terminal block		Connector	Connector (2x)
Internal current consumption (5V)		Approx. 30mA	Approx. 50mA	Approx. 250mA	Approx. 120mA
External power supply (Module supply voltage)		12/24V DC (+10%, -15%, maximum 30mA)			

*1: The module needs to be repaired in case the fuse is blown. The fuse cannot be replaced by the customer.

Transistor Output Modules, Source Type

Item		EH-YTP8	EH-YTP16	EH-YTP16S	EH-YTP32	EH-YTP64
Output specification		Transistor output (source type)				
I/O assignment		Y16	Y16	Y16	Y32	Y64
Rated load voltage		12/24V DC (+10%, -15%)				
Minimum switching current		1mA				
Leak current		0.1mA				
Maximum load current	Output	0.3A	0.3A	0.8A	0.2A	0.1A
	Common	2.4A	4.0A	5.0A	6.4A	2.0A
Output response time	OFF -> ON	0.3ms or less				
	ON -> OFF	1.0ms or less				
Number of output points		8	16	16	32	64
Number of common points		1	1	1	1	2
Surge removal ladder		Diode		Built in	Diode	
Fuse (per common) *1		4A	8A	None	8A	3A
Electronic short circuit protection		-	-	●	-	●
Insulation system		Photocoupler				
Output display		LED's (green)				
External connection		Removable type screw terminal block			Connector	Connector (2x)
Internal current consumption (5V)		Approx. 30mA	Approx. 50mA	Approx. 50mA	Approx. 250mA	Approx. 100mA
External power supply (Module supply voltage)		12/24V DC (+10%, -15%, maximum 30mA)				

*1: The module needs to be repaired in case the fuse is blown. The fuse cannot be replaced by the customer.

Digital Output Modules

Item		EH-YR12	EH-YS4
Output specification		Relay output	Triac output
I/O assignment		Y16	Y16
Rated load voltage		100/240V AC, 24V DC	100/240V AC (85 to 250V AC)
Minimum switching current		1mA	100mA
Leak current		none	5mA or less
Maximum load current	Output	2A	0.5A
	Common	5A	2A
Output response time	OFF -> ON	10ms or less	1ms or less
	ON -> OFF	10ms or less	1ms + 1/2 cycle or less
Number of output points		12	4
Number of common points		1	1
Surge removal ladder		None	Varistor
Fuse		None	4A
Insulation system		Photocoupler	Photo triac
Output display		LED's (green)	
External connection		Removable type screw terminal block	
Internal current consumption (5V)		Approx. 40mA	Approx. 100mA
External power supply (Module supply voltage)		24V DC (+10%, -5%, maximum 70mA)	100/240V AC (85 to 250V AC)

Analog Input Modules

Item		EH-AX44	EH-AX8V/H	EH-PT4
Input current range		4 to 20mA	-	-
Input voltage range		0 to 10V	0 to 10V (V) / -10 to 10V (H)	-
Temperature-sensing element		-	-	PT100 / PT1000
I/O assignment		Word X 8W	Word X 8W	Word X 4W
Resolution		12 bits	12 bits	15 bits
Conversion time		less than 5ms	less than 5ms	1s
Total accuracy		Less than +/-1% (full scale)	Less than +/-1% (full scale)	-
Measuring range and accuracy	-50°C to 400°C (PT100)	-	-	+/-3% (-50°C to 400°C), +/-0.5% (-20°C to 40°C)
	-50°C to 400°C (PT1000)	-	-	+/-6% (-50°C to 400°C)
Input impedance	Current input	Approx. 100Ω	-	-
	Voltage input	Approx. 100kΩ	Approx. 100kΩ	-
Insulation system	Channel - internal circuit	Photocoupler	Photocoupler	Photocoupler
	Between channels	Not insulated	Not insulated	Not insulated
No. of channels	Current inputs *1)	4 Channels/module (Channels 0 - 3)	-	-
	Voltage inputs *1)	4 Channels/module (Channels 4 - 7)	8 Channels/module (Channels 0 - 7)	-
	PT100/PT1000	-	-	4 Channels/module
External connection		Removable type screw terminal block	Removable type screw terminal block	Removable type screw terminal block
Internal current consumption (5V)		Approx. 100mA	Approx. 100mA	Approx. 300mA
External power supply (Module supply voltage)		24V DC (+20%, -15%, approx. 150mA)	24V DC (+20%, -15%, approx. 150mA)	24V DC (+/-10%, approx. 100mA)
External wiring		2-core shielded	2-core shielded	3-core shielded

*1): Both current inputs and voltage inputs are available at the same time.

Analog Output Modules

Item		EH-AY22	EH-AY2H	EH-AY4V/H
Ouput voltage range		0 to 10V	-10 to 10V	0 to 10V (V) / -10 to 10V (H)
Output current range		4 to 20mA	-	-
I/O assignment		Word Y 8W		
Resolution		12 bits		
Conversion time		less than 5ms		
Total accuracy		Less than +/-1% (full scale)		
External load	Voltage output	10kΩ or more		
	Current output	0 to 500Ω	-	
Insulation system	Channel - internal circuit	Photocoupler		
	Between channels	Not insulated		
No. of channels	Voltage outputs *3	2 Channels/module (Channels 0 - 1)	2 Channels/module (Channels 0 - 1)	4 Channels/module (Channels 0 - 3)
	Current outputs *3	2 Channels/module (Channels 2 - 3)	-	-
External connection		Removable type screw terminal block		
Internal current consumption (5V)		Approx. 100mA		
External power supply (Module supply		24V DC (+20%, -15%, approx. 150mA)		
External wiring		2-core shielded		

*3: Both current outputs and voltage ouputs are available at the same time.

Counter Modules

Item		EH-CU	EH-CUE
Input	Counter pulse frequency	Max. 100kHz	
	Counter range	32bit (0 to 4,294,967,295)	
	Number of channels	2 channels	1 channel
	Counter system	2 phase pulse count, 1 phase pulse count	
	Counter pulse width	More than 4μs	
	Marker pulse width	More than 10μs	
	Pulse voltage	5V/10mA (differential signal) or 24V/2.5kΩ (voltage signal)	
	Pulse input points number	A: A-phase, B: B-phase, M: Marker, total 3points/channel	
	Insulation system	Photocoupler	
Output	Output voltage	DC 10 to 30V	
	Output points	2 points/channel	
	Max. load current	20mA/point	
	Min. load current	1mA	
	Output system	Transistor (open collector)	
	Insulation system	Photocoupler	
	Polarity	Common -	
Internal current consumption (5V)		Approx. 300mA	
I/O assignment		FUN 0 (X5W/Y3W)	
External connection		One 30pin connector for 2 channels	
External wiring		Paired common shielded wire	

Positioning Module

Item		EH-POS
Number of Axis		1
Positioning data	Data number	256 points
	Setting method	Sequence program / Positioner
I/O system	Output system	Pulse line Open collector (9 to 30V DC) / Line driver (5V DC)
	Input system	Sink/Source (10.8 to 30V DC)
	Insulation system	Photocoupler
Positioning system	System	Absolute system, Absolute + Increment system, Increment system
	Positioning command unit	Pulse/um/inch/degree
	Speed command	25 to 400k Pulse/s
	Speed stage	10
	Acceleration and decceleration speed system	Linear acceleration and deceleration speed / S-curved acceleration and deceleration speed
	Acceleration and decceleration speed time	1 to 65,535ms
	Range	+2,147,463,647 to -2,147,463,647
Internal current consumption (5V)		Approx. 300mA (600mA, Positioner connected)
I/O assignment		4W/4W
External connection		20pin connector
External wiring		Paired common shielded wire

Fieldbus Master Modules

Item		EH-RMP	EH-RMD
Fieldbus system		Profibus-DP	DeviceNet
General	Type	Class 1 Profibus-DP master	DeviceNet™ 2.0
	Supported by CPU's	EH-CPU308, EH-CPU316, EH-CPU448	EH-CPU308, EH-CPU316, EH-CPU448
Function	Max. number of modules	2/CPU (Slot 0-2)	2/CPU (Slot 0-2)
	Max. number of Slaves	124	63
	Output data	256 words	256 words
	Input data	256 words	256 words
Max. segment length (at data transfer rate).	9.6 kbps	1200m	-
	19.2 kbps	1200m	-
	45.45 kbps	1200m	-
	93.75 kbps	1200m	-
	125 kbps	-	500m
	187.5 kbps	1000m	-
	250 kbps	-	250m
	500 kbps	400m	100m
	1500 kbps	200m	-
	3 Mbps	100m	-
	6 Mbps	100m	-
	12 Mbps	100m	-
Internal current consumption (5V)		Approx. 600mA	Approx. 600mA
I/O assignment		LINK	LINK
External connection		9 pin D-sub, female	5-pole DeviceNet connector
External wiring		Double shielded twisted pair cables according to Profibus specification	DeviceNet™ dedicated cable
Self diagnosis		System ROM/RAM check, watch-dog timer check	System ROM/RAM check, watch-dog timer check
Link area settin	Link area 1	Output area starts at WL0, Input area starts independent from Link area setting allways at WL200	Output area starts at WL0, Input area starts independent from Link area setting allways at WL200
	Link area 2	Output area starts at WL1000, Input area starts independent from Link area setting allways at WL1200	Output area starts at WL1000, Input area starts independent from Link area setting always at WL1200
File for configuration		-	EDS-file, File name:Eh_rmd_1_1.eds. This file can either be downloaded from the web (www.hitachi-ds.com) or received by contacting Hitachi Europe
Configurator software		Profibus configurator software, Order-Number: PBDP-M-CONF	DeviceNet configurator RSNetworx and dedicated interface adapter

Fieldbus Slave Modules

Item		EH-IOCP	EH-IOCD
Fieldbus system		Profibus-DP	DeviceNet
General	Type	Profibus-DP slave module for use with standard I/O modules of EH-150 series	DeviceNet slave module for use with standard I/O modules of EH-150 series
Function	Max. number of base-racks	2 (2nd rack connected via EH-IOC)	2 (2nd rack connected via EH-IOC)
	Max. number of modules	16	16
	Node address range	1 - 99	1 - 63
	Max. number of I/O's (with 64 point I/O modules	1024	1024
	Max. input and output data	208 words	208 words
	In data update cycle time	5ms	5ms
Max. segment lenght (at data transfer rate).	9.6 kbps	1200m	-
	19.2 kbps	1200m	-
	45.45 kbps	1200m	-
	93.75 kbps	1200m	-
	125 kbps	-	500m
	187.5 kbps	1000m	-
	250 kbps	-	250m
	500 kbps	400m	100m
	1500 kbps	200m	-
	3 Mbps	100m	-
	6 Mbps	100m	-
	12 Mbps	100m	-
Internal current consumption (5V)		Approx. 600mA	Approx. 600mA
I/O assignment		fixed at CPU-Slot	fixed at CPU-Slot
External connection		9 pin D-sub, female	5-pole DeviceNet connector
External wiring		Double shielded twisted pair cables according to Profibus specification	DeviceNet™ dedicated cable
Self diagnosis		System ROM/RAM check, watch-dog timer check	System ROM/RAM check, watch-dog timer check
File for configuration		GSD-file, File name:Hita049d.gsd. This file can either be downloaded from the web (www.hitachi-ds.com/sub/info/updates) or received directly from Hitachi Europe	EDS-file, File name: Absdev.eds. This file can either be downloaded from the web (www.hitachi-ds.com/sub/info/updates) or received directly from Hitachi Europe
Configurator software		Profibus configurator software, Order-Number: PBDP-M-CONF	DeviceNet configurator RSNetworx and dedicated interface adapter

Accessories

I/O controller module for expansion rack

Type	
EH-IOC	I/O controller module for mounting on the CPU-Slot of the expansion rack.

Connecting cable between base rack and I/O controller

Type	
EH-CB10	Cable to connect the I/O controller EH-IOC with the connector on the right side of the base rack.

Dummy module

Type	
EH-DUM	Dummy module to cover not used slots on base and expansion rack.

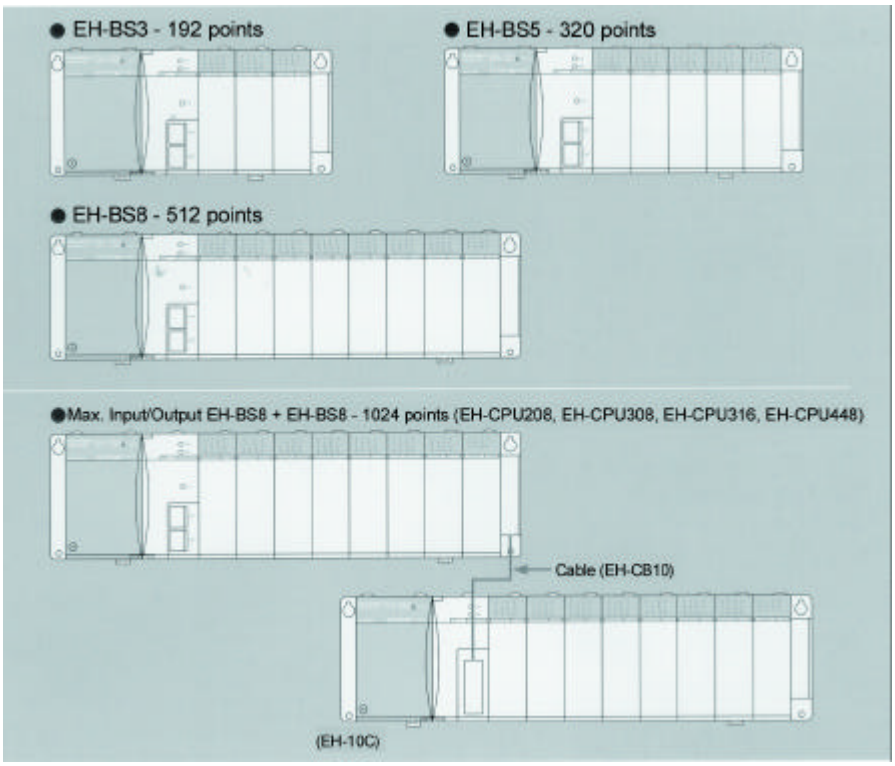
Battery

Type	
LIBAT-H	Battery for the CPU to keep the contents of the retentive area and the RTC running while the power is switched of.

Cables

Type	
EH-PROG20	Programming cable to connect the serial communication ports of the CPU's to a 9-pole Sub-D serial interface of a PC (lenght 2m).
EH-HEH30	Communication cable between the serial communication ports of the CPU's to an HMI of Hitachi's EH-HMI series (lenght 3m).
EH-32XY04	Ready-to-use connecting cable for the 32- and 64-point I/O modules with dedicated plug on one end, open on the other end (lenght 4m).
EH-CUCN40	Ready-to-use connecting cable for the Counter-modules with dedicated plug on one end, open on the other end (lenght 4m).

System Configuration


● EH-BS3 - 192 points
● EH-BS5 - 320 points
● EH-BS8 - 512 points
●Max. Input/Output EH-BS8 + EH-BS8 - 1024 points (EH-CPU208, EH-CPU308, EH-CPU316, EH-CPU448)
Cable (EH-CB10)
(EH-10C)